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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)	
Office Action Summary	10/748,427	WHITE, DAN M.	
	Examiner	Art Unit	
	JUNCHUN WU	2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>08 September 2008</u>.

2a) ☐ This action is **FINAL**.　　2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-3,5,7,9-13,15-18,20 and 24-32</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-3,5,7,9-13,15-18,20 and 24-32</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a) ☐ All　b) ☐ Some * c) ☐ None of:

　　　1. ☐ Certified copies of the priority documents have been received.

　　　2. ☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
　Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
　Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to remark filed on Sept. 8, 2008.

2.   Claims 1-3, 5, 7, 9-13, 15-18, 20, and 24-32 are pending.

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 13-15 are rejected under 35 USC 101 because the body of the claims recites various

modules which are interpreted to be software per se.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1-3, 5, 7, 12, 13, 15 and 25- 30 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Bade et al. (US Pub. No.20020059054 A1, hereinafter "Bade"), in view of

Mulchandanii et al. (US Patent No. 5,701,488, hereinafter "Mulchandanii").

6.   Per claim 1

       Bade discloses

- A method of displaying embedded firmware program information ([0021] "An

integrated design environment (IDE) is disclosed for simulating embedded systems")

Comprising:

- displaying a first screen to interact with a user for high level function selections ([0101]

  "As shown in FIG.21the IDE preferably has a menu-driven graphical user interface that

  preferably includes a design window for creating a design with toolbars for accessing

  functions using a computer mouse or similar interface. The IDE preferably includes a

  peripheral design editor and simulator that is adapted to permit hardware IP components

  and processes to be created and linked with other IP components. ").

- displaying a second screen to show hardware resources for a programmable circuit

  ([0099] *"As shown in FIGS. 28, 29, and 37, the use of an instruction set accurate*

  simulator to model a processor core permits the processor simulator to exchange

  memory transactions with the hardware partition and to receive interrupts from the

  hardware partition using APIs linking the hardware partition and the instruction set

  accurate simulator. ").

- displaying a third screen to show source code for a plurality of source code programs to

  control the programmable circuit ([0173] *"The IDE preferably features a high-quality*

  C++ code generator, hiding all the details of generating simulation code…")

- displaying a fourth screen to render symbolic information associated with the displayed

  source code ([0104] *"FIG. 36B shows an example of a software debugger interface*

  window 3685 superimposed over a design window 3620 of a virtual embedded system."

  & In Fig. 36B shows the design window 3620 associated with source code that is

  debugging in debugger window 3620).

The symbolic information comprising:

- listings including named registers, data labels for word, byte and short entities and name of data structures ([0163] "As shown in **FIG. 26, a** Test Bench Builder Toolbar is preferably included to represent the test bench controls, such as a LED, LCD, memory viewer, ASCII terminal window, resource meter, or signal button, and the test bench builder, allows a user to quickly add these controls to a test bench." ; the memory viewer may view data words, short words and byte values; and register viewer may list information associated with registers).

- address locations for the code labels and the data labels ([0105] *"FIG. 38 is a screen shot of an exemplary processor symbol 3805 and two peripherals 3830 and 3840. FIGS. 39-40 are exemplary screen shots showing a Configuration Wizard and configuration data for coupling read/write memory transactions and interrupt signals between the FSM representation of the hardware peripherals and the ISA processor..."*).

But Bade does not disclose

- code labels, data labels referring to data structures comprising fields, data register names, and index register names; addresses and values of the word containing a start of the field.

However Mulchandani discloses MCUdebug which supports 3 different modes of viewing bus state analyzer data

- code labels, data labels referring to data structures comprising fields, data register names, and index register names; and names of the data structures (col.7 lines 41-47 *"Table T-1 is an example of an "Instruction Mode" Bus State Analyzer display. The columns in Table T-1 are "FrU"' (Frame Number), "A&." (Instruction Address), "Data (normally opcode),*

"Label", "Codede" and "Bus Cycle". MCUdebug supports a wide range of commands which allow a user to perform custom setup of the analyzer" & col.13 lines 23-30

"MCUdebug provides a rich set of functions which can allow a user to view analyzer data in variety of ways. The Bus State Analyzer window displayed in Table 1 is an example of the "Instructions Only" view mode of the bus state analyzer data. In the right section of the window (under the label "Bus Cycle") the data displayed shows the actual bus cycle that occurred on the execution of that particular instruction." & col.12 lines 20-27 & see Table T-1).

- Bade discloses data structures that a re expandable (Refer to Fig. 31 & [0169] *"…By left-clicking on a Symbol, Block or Process, the construct can be opened directly and edited.".* In Fig.31, in the ordinary skill of arts, user may click a on the '+' button to expand hierarch to show its sub-structure and click a '-' button to collapse an expanded hierarch."). Further, Mulchandani discloses MCUdebug which supports 3 different modes of viewing bus state analyzer data comprising address and values of the word contain in fields (see Table T-1).

- Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine teaching of Bade with the teachings of Mulchandani to include code labels, data labels referring to data structures, data register names, and index register names and addresses and values of the word containing a start of the field in order to provide some information close to console from debugger and allow a user to observe the state of the application at any point (col.4 lines 32-40).

7. Per claim 2

the rejection of claim 1 is incorporated and Bade further discloses

▪ displaying source code associated with a symbol in the fourth screen selected by user

   ([0101] *"Referring to **FIG. 15,** in a preferred embodiment the graphical object symbols*

   *may be selected from a menu **1520,** a textual portion of the object input by the user, and*

   the graphical object connected to other graphical objects using connectors 1505.").

8.   Per claim 3

      the rejection of claim 2 is incorporated and Bade further discloses

▪ displaying a view source button in the fourth screen configured to be activated by a

   computer mouse to view source code associated with symbol (*As shown in **FIG.**15 or*

   *toolbar shown in **FIG.**25, the button **C** is for generate C++ code when user click it by*

   mouse).

9.   Per claim 5

      the rejection of claim 1 is incorporated and Bade further discloses

▪ displaying the symbolic information in the fourth screen without typing by the user

   ([0101] *"Referring to **FIG. 15,** in a preferred embodiment the graphical object symbols*

   *may be selected from a menu **1520,** a textual portion of the object input by the user, and*

   the graphical object connected to other graphical objects using connectors 1505.").

10.   Per claim 7

      the rejection of claim 1 is incorporated and Bade further discloses

▪ displaying a device enabling expansion of the displayed symbolic information ([0129]

"***FIG. 16*** *shows a Block construct containing a single Process construct, two Block*

constructs and a Declaration construct." *& [0131] "In the example, the interrupt*

controller waits for an interrupt signal, as sent by one of the two peripheral devices. The

Symbol for a Signal-In construct is a rectangle with an arrow pointing inward as either

its left or right side.").

11.   Per claim 12

     the rejection of claim 1 is incorporated and Bade further discloses

   ■   the programmable circuit includes a processor ([0021] *"The IDE includes*

a graphical user interface and a design language for forming finite state machine models

of hardware components that are coupled to processor simulators, preferably instruction

set accurate simulators of processor cores.").

12.   Per claim 13

   ■   Same reasons as rejected to claim 1.

13.   Per claim 15

the rejection of claim 13 is incorporated and Bade further discloses

   ■   the device includes a processor ([0021] *"The IDE includes a graphical user interface and*

a design language for forming finite state machine models of hardware components that

are coupled to processor simulators, preferably instruction set accurate simulators of

processor cores.").

14.   Per claim 25

the rejection of claim 1 is incorporated

Bade further discloses

- the data structures and the fields of the data structures are individually expandable
  comprises the data structures and the fields of the data structures being configured to be
  expandable by a user using a user interface (Refer to Fig. 30 & [0164] "…*allowing in a
  single click to quickly browse and navigate a design's hierarchy or signal connectivity.*"
  In Fig.30, in the ordinary skill of arts, user may click a on the '+' button to expand
  hierarch to show its sub-structure and click a '-' button to collapse an expanded
  hierarch.).

15.   Per claim 26

the rejection of claim 25 is incorporated

Bade further discloses

- the data structures and the fields of the data structures are configured to be individually
  collapsible after being expanded by a user using a user interface (Refer to Fig. 30 &
  [0164] "…*allowing in a single click to quickly browse and navigate a design's hierarchy
  or signal connectivity.*" In Fig.30, in the ordinary skill of arts, user may click a on the '+'
  button to expand hierarch to show its sub-structure and click a '-' button to collapse an
  expanded hierarch.).

16.   Per claim 27

the rejection of claim 25 is incorporated

Bade further discloses

- the user interface is a mouse interface ([0101] "As shown in FIG. 21, the IDE preferably has a menu-driven graphical user interface that preferably includes a design window for creating a design with toolbars for accessing functions using a computer mouse or similar interface. ").

17.   Per claim 28

the rejection of claim 13 is incorporated

Bade further discloses

- the data structures and the fields of the data structures are individually expandable comprises the data structures and the fields of the data structures being configured to be expandable by a user using a user interface (Refer to Fig. 30 & [0164] "...*allowing in a single click to quickly browse and navigate a design's hierarchy or signal connectivity.*" In Fig.30, in the ordinary skill of arts, user may click a on the '+' button to expand hierarch to show its sub-structure and click a '-' button to collapse an expanded hierarch.).

18.   Per claim 29

the rejection of claim 28 is incorporated

Bade further discloses

- the data structures and the fields of the data structures are configured to be individually

  collapsible after being expanded by a user using a user interface (Refer to Fig. 30 &

  [0164] "…*allowing in a single click to quickly browse and navigate a design's hierarchy*

  or signal connectivity." In Fig.30, in the ordinary skill of arts, user may click a on the '+'

  button to expand hierarch to show its sub-structure and click a '-' button to collapse an

  expanded hierarch.).

19.   Per claim 30

the rejection of claim 28 is incorporated

Bade further discloses

- the user interface is a mouse interface ([0101] "As shown in FIG. 21, the IDE preferably

  has a menu-driven graphical user interface that preferably includes a design window for

  creating a design with toolbars for accessing functions using a computer mouse or similar

  interface. ").

20.   Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bade, in view of

Mulchandani and further view of van Hoff et al. (U.S. Patent No. 5,778,231 hereinafter "Hoff").

21.   Per claim 9

the rejection of claim 1 is incorporated

Both Bade and Mulchandani do not disclose

- parsing the source code to create the listings in the fourth screen.

But Hoff discloses

- parsing the source code to create the listing in the fourth screen (col.2 lines 12-17 *"The inventive compilation method for compiling program source code on a computer to generate compiled code includes identifying symbol references in the source code sequentially as the symbolic references occur in the source code, and parsing the code during the compilation to identify each symbol that references another program."*).

- Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine teachings of Bade and Mulchandani and further include parsing the source code to create the listings in the fourth screen by teachings of Hoff in order to identify externally defined symbols so that the compiler can determine whether the symbols is reference to a remotely located file or to a locally stored file. (Hoff, col.5 lines 42-49).

22.   Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bade, in view of Mulchandani, Hoff and further view of Hall et al. (US Patent No.4, 720,778 hereinafter "Hall").

23.   Per claim 10

the rejection of claim 9 is incorporated

Bade, Mulchandani and Hoff do not disclose

- outputting symbolic information for a data structure recursively until resultant fields are no longer structures.

However Hall discloses

- outputting symbolic information for a data structure recursively until resultant fields are no longer structures (col.13 lines 36-38 *"Values of important variables can be seen at each level of a recursive procedure; this is especially useful if a procedure is stuck in infinite recursion."*).

- Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine teachings of Bade, Mulchandani and Hoff and further include outputting symbolic information for a data structure recursively until resultant fields are no longer structures by the teachings of Hall in order to trace the values of data at the entry and exit points of procedure. (Hall, col.13 lines 23-24).

24.   Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bade, in view of Mulchandani, and further view of Smith et al. (U.S. Patent No. 6,311,324 B1 hereinafter "Smith").

25.   Per claim 11

the rejection of claim 1 is incorporated

Both Mulchandani and Bade do not disclose

- displaying the symbolic information for particular regions of the source code

But Smith discloses

- displaying the symbolic information for particular regions of the source code (col.4 lines 36-39 *"a tuning program proceeds to analyze application code modules to identify critical regions called hotspots, and displays a graphical view of every hotspot in a module"*).

- Therefore, it would have been obvious to a person of ordinary skill in the art at the time
  the invention was made to combine teachings of Bade and Mulchandani and further
  include displaying the symbolic information for particular regions of the source code by
  the teachings of Smith in order to help the user to analyze the region. Once the region has
  been identified and analyzed, the program advises the user on how to rewrite the program
  code to improve the performance of the overall application. (Smith, col.3 lines 4-9).

26.   Claims 16-18, 20 and 31- 32 are rejected under 35 U.S.C. 103(a) as being unpatentable
over Bade, in view of Mulchandani, Hoff and further view of Hall.

27.   Per claim 16

- Same reasons as rejected to claim 1.

28.   Per claim 17
the rejection of claim 16 is incorporated and Bade further discloses

- displaying source code selected by user ([0101] *"Referring to FIG. 15, in a preferred
  embodiment the graphical object symbols may be selected from a menu 1520, a textual
  portion of the object input by the user, and the graphical object connected to other
  graphical objects using connectors 1505."*).

29.   Per claim 18
the rejection of claim 16 is incorporated and Bade further discloses

- displaying the source code in the fourth screen selected by the user by clicking on a view

  source button (*As shown in **FIG**.15 or toolbar shown in **FIG**.25, the button **C** is for*

  generate C++ code when user click it by mouse).

30.   Per claim 20

      the rejection of claim 16 is incorporated and Bade further discloses

- displaying the symbolic information in the fourth screen without typing by the user

  ([0101] *"Referring to **FIG. 15**, in a preferred embodiment the graphical object symbols*

  *may be selected from a menu **1520**, a textual portion of the object input by the user, and*

  the graphical object connected to other graphical objects using connectors 1505.").

31.   Per claim 31

the rejection of claim 16 is incorporated

Bade further discloses

- the data structures and the fields of the data structures are individually expandable

  comprises the data structures and the fields of the data structures being configured to be

  expandable by a user using a user interface (Refer to Fig. 30 & [0164] *"…allowing in a*

  single click to quickly browse and navigate a design's hierarchy or signal connectivity."

  In Fig.30, in the ordinary skill of arts, user may click a on the '+' button to expand

  hierarch to show its sub-structure and click a '-' button to collapse an expanded

  hierarch.).

32.   Per claim 32

the rejection of claim 31 is incorporated

Bade further discloses

- the data structures and the fields of the data structures are configured to be individually

    collapsible after being expanded by a user using a user interface (Refer to Fig. 30 &

    [0164] "...*allowing in a single click to quickly browse and navigate a design's hierarchy*

    or signal connectivity." In Fig.30, in the ordinary skill of arts, user may click a on the '+'

    button to expand hierarch to show its sub-structure and click a '-' button to collapse an

    expanded hierarch.).

33.   Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bade et al., in

view of Mulchandani, Hoff, and Hall and further view of Smith.

34.   Per claim 24

the rejection of claim 16 is incorporated

Bade, Mulchandani, Hoff and Hall do not disclose

- displaying the symbolic information for particular regions of the source code in the fourth

    screen

But Smith discloses

- displaying the symbolic information for particular regions of the source code in the fourth

    screen (col.4 lines 36-39 "*a tuning program proceeds to analyze application code*

modules to identify critical regions called hotspots, and displays a graphical view of

every hotspot in a module").

- Therefore, it would have been obvious to a person of ordinary skill in the art at the time
  the invention was made to combine teachings of Bade, Mulchandani, Hoff and Hall and
  further include displaying the symbolic information for particular regions of the source
  code in the fourth screen by the teachings of Smith in order to help the user to analyze the
  region. Once the region has been identified and analyzed, the program advises the user on
  how to rewrite the program code to improve the performance of the overall application.
  (Smith, col.3 lines 4-9).

Response to Arguments

Applicant's arguments filed on Sept. 8, 2008 have been fully considered but they are not
persuasive.

- In the remarks, Applicant argues that:

(a)   In regard to independent claim 1, prior art fails to show a single screen that has symbolic
information with the same limitations as recited in claim 1.

(b)   If prior art Mulchandani combine with Bade, the hypothetical combination would not
disclose or suggest a forth screen to render symbolic information.

Examiner's response:

Examiner disagrees.

(a)   Prior art Bade discloses In Fig. 36B shows the design window 3620 associated with

source code that is debugging in debugger window and in paragraph [0103] describes "As used

in this application a test-bench builder is an application that allows a designer to build a

simulation of an embedded system by adding graphical objects (e.g., buttons, LEDs, LCDs,

alpha-numeric keyboards, telephone keypads, register viewers, memory viewers, resource

meters, etc.) to mimic a physical human-machine interface of an embedded system product as

Shown in Figs 33A and 33B". For those graphical objects are in Test Bench Builder Toolbar as

shown in Fig.26. Although the symbolic information are not displaying in a single screen, for

one of ordinary skill in the art it is an obvious matter of design choice.

(b)   One of Bade's inventions is disclosed for simulating embedded systems. A software

debugger permits software to be loaded and executed for the simulation. In a preferred

embodiment, the software debugger is adapted to permit at least one binary program code of a

software application compiled for a target processor to be loaded by a user and executed on the

virtual embedded system. On the other prior art Mulchandani present invention generally relates

to circuit testing, and more specifically to providing an interactive embedded MCU test

environment. Both of prior arts are related disclosing debugger and provide an interface in the

embedded systems. Further, Mulchandani discloses a table which is to view bus state analyzer

data comprising data label, code label and address fields. In response to applicant's argument

that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it

must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction

based upon hindsight reasoning. But so long as it takes into account only knowledge which was

within the level of ordinary skill at the time the claimed invention was made, and does not

include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper.

See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to JUNCHUN WU whose telephone number is (571)270-1250. The

examiner can normally be reached on 8:00-17:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wei Zhen can be reached on 571-272-3708. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JW
/Wei Y Zhen/
Supervisory Patent Examiner, Art Unit 2191